Date: 05-12-2022

BSc (Hons) Animal Health and Welfare

UCAS code	D730
Institution code	H12
Duration	4 years (full-time) including a one-year work placement. A three year programme is available for applicants with at least two years, full-time relevant work experience.
Start date	September 2023
Location	Harper Adams University campus (and location of work placement)*

The course

If you care about animal health and have an interest in applying scientific principles to improve animal welfare across a range of species, then this is the course for you.

You will study a range of modules including anatomy and physiology, animal management, laboratory skills and principles of health and welfare which apply to real life situations. In the second year you will study more specialised topics such as farm, equine and companion animal health, ethics, nutrition, disease and biotechnology.

Year 3 is a full placement year in industry as part of your degree, enabling you to put knowledge into practice, develop your network and discover your future ambitions. When you return from placement you will enter Year 4 where you will carry out a scientific investigation of your choice, alongside core and optional modules to further your interests.

Duration

4 years (full-time) including a one-year work placement. A three year programme is available for applicants with at least two years, full-time relevant work experience. Please contact Admissions for further information on this option.

A-level entry requirements

- Offers tend to be in the region of **88 - 104** UCAS points (from A2 exams only)
- An understanding of a biological science based subject, for example Biology, Human Biology, Applied Science or Physical Education would be preferable. We would welcome applications from candidates offering other evidence of their suitability for this programme
- Students should typically be studying **3 subjects at A2 level** to be considered
- When combining qualifications no more than one Subsidiary Diploma or Diploma (or comparable qualification such as an Extended Certificate) will be considered alongside A levels (two A levels for BSc)
- General Studies and Critical Thinking are encouraged but **not** included in grades required
- Applicants are encouraged to gain experience working with a number of different animals in different settings. Applicants should include details of this in their application. Experience of different animals will enable reflection and will help with many aspects as students' progress through the course.
- **4 GCSEs at grade C/4 or above**, including English Language, Maths and a Science

- Where an applicant was not given access to GCSE Science, a BTEC level 2 in Science will be accepted as an alternative at a grade M. Confirmation will be required from the school/college that GCSE Science was not an option.
- Applicants can expect to receive offers including specific grades in specific subjects (for example, a B or C at A level, or an M or D for BTEC modules)
- Key Skills (and other level 2 variants) and First Certificates/Diplomas are not accepted in place of GCSE passes
- Interviews will take place on an ad-hoc basis should the Course Manager wish to discuss any aspect of your application and for all potentially suitable applicants who require visa sponsorship.
- Overseas applicants please check our English Language Requirements
- We have developed a range of measures and initiatives to give everyone the best chance to access our undergraduate degree programmes. The main feature of **Access to Harper** is our contextualised offer scheme. A contextualised offer is an offer which is reduced, by one grade or more from the standard entry requirement and is made to those applicants who may have experienced personal circumstances which put them at a disadvantage during their education, such as attending a low achieving school, living in an area of low participation in Higher Education or being a Care Leaver. The aim of this is to make the University more accessible for those applicants who may not have previously thought that they were eligible to apply. We have also introduced reduced entry requirements for those applicants who are over 21 years of age and further initiatives to make the application process easier for those applicants who need it.

  To check if you qualify please visit the Access to Harper page.

Note: Entry Requirements are for guidance only, please check the UCAS website or contact Admissions for further information.

Work placement

On placement you will apply your developing skills and gain experience to underpin subsequent studies, and explore the wide range of career options available. With a clearer idea of your future career in mind, after placement you will be able to choose modules to help you develop the skills you need.

Teaching and learning

What you study

This is a multi-disciplinary course incorporating a variety of applied science and animal management modules. It looks at normal body structure and functioning, mechanisms to enhance health and welfare and develops students' abilities to synthesise solutions to a range of animal-related problems.

Companion (pet) animals and farm livestock are given equal weighting on the course. There are also opportunities to choose optional modules. This allows you to specialise or gives you the flexibility to study over a wide area.

Teaching and learning

Lectures are complemented by tutorials, visits and practical classes. Depending on the module, practicals may take the form of laboratory work, behaviour/welfare assessments or animal handling in the Companion Animal House or on the University Farm.

* During the Covid-19 Pandemic the University is delivering blended learning. Government guidance is being constantly reviewed to establish the learning events which can be delivered face to face. Please refer to our frequently asked questions for further details.

Assessment methods

A wide range of assessment methods are used. Depending on the module these include examination, assignments, practical spot-tests and presentations.

Learning in Higher Education – how is it different?

Whilst a student's prior experience or qualifications should prepare them for Higher Education, most will find that study at university level is organised differently than they might have experienced at either school or college. Higher Education sets out to prepare students to think and learn independently, so that they are able to continue learning new things beyond their studies and into the workplace, without needing a tutor to guide them. This means that the time spent in classes with tutors provides direction, guidance and support for work that students undertake independently through:

- finding useful information sources and compiling bibliographies of reading material, in paper and online
- reading and making notes to help make fuller sense of subjects
- engaging with online materials and activities found on the University's own virtual learning environment
- preparing assignments to practise skills and develop new insights and learning
- preparing for future classes so you can participate fully

In order to develop the skills of a graduate (whether at Foundation Degree or Honours Degree levels), students are expected to not only be able to recall and explain what they know but also to be able to:

- **apply** what they know to new problems or situations
- **analyse** information and data and make connections between topics to help make sense of a situation
- **synthesise**, or draw together, the information and understanding gained from a range of sources, to create new plans or ideas
- **evaluate** their own work and also the work of others, so that they can judge its value and relevance to a particular problem or situation

Tutors will expect students working towards a Degree to be able to use what they know to solve problems and answer meaningful questions about the way in which aspects of the world work and not just rote-learn information that they have been told or read, for later recall. This means using all the bullet-pointed skills and to think critically by questioning information, whilst also being rigorous in checking the value of the evidence used in making one's own points. Students will be expected to become increasingly responsible for recognising the areas where they themselves need to develop. Taking careful note of tutor feedback can help to identify the skills and abilities on which attention could usefully be focused. To be successful, students need to be self-motivated to study outside of classes, especially since in higher education, these higher level skills need to be practised independently.

At Harper Adams students are gradually supported to become less reliant on class-based learning, so that they are able to spend a greater proportion of their time in their final year working on projects of interest to themselves and in line with their future career aspirations. Whilst in the first year of a course, a student might spend around one-third of their time in class, they will typically spend 15 - 20% in class by the time they reach their Honours year. At Harper Adams, we are fortunate to have not only an extensive estate and great facilities for students to use as a source of information and inspiration, we also have a well-stocked library and access to countless specialist sources of paper-based and online information. Many of the staff at Harper Adams are involved in research work, which helps ensure the content of the courses is at the forefront of the discipline. This also means that amongst the library books and online journals that students use, there may be some familiar names.

The Bamford Library and Faccenda Centre each have spaces in which students can work, either individually or in small groups, using either their own laptop computers or the provided desktop computers, all of which can access the network. Working spaces are zoned to reflect different working conditions, so there is a study space for everybody, whether they need silence or work better in a livelier environment.

Careers

Careers in this field are varied and rewarding. There are opportunities in animal health with companies associated with the development and marketing of animal health products. Nutritional products and special diet formulations are being developed for animals with health problems, and knowledge of both animal health and nutrition equips graduates for careers in this area.

Welfare and food safety concerns have led to job opportunities in quality assurance, with schemes being developed by the RSPCA, supermarkets and the farming industry. Or you may consider a career in animal welfare and the management of collection animals, in animal physiotherapy or in the pet care industry.

What will I study?

Year 1		Year 2		Year 3	Year 4	
Professional Scholarship Programme (PSP) 1 - Academic Skills Development (A4001C17)	15	Animal Disease Science (A5009C17)	15	Placement year	Honours Research Project (HRPROJC17)	30
Fundamentals of Physiology (A4007C17)	15	Companion Animal Studies (A5012C17)	15		Integrated Health Management (A6018C17)	30
Applied Anatomy and Physiology (A4006C17)	15	Farm Animal Health (A5005C17)	15		Applied Companion Animal Health, Welfare and Behaviour (A6007C17)	15
Companion Animal Management (A4017)	15	Farm Animal Nutrition (A5002C17)	15		Advances in Farm Animal Health, Welfare and Behaviour (A6003C17)	15
Large Animal Management (A4015C17)	15	Equine Science (A5013C17)	15		**Options**	
Principles of Animal Health (A4011C17)	15	Research Methods (Animals) (A5011C17)	15		Advances in Animal Production Science (A6001C17)	15
Laboratory Techniques (A4004C17)	15	Principles of Animal Behaviour and Welfare (A5008C17)	15		Animal Improvement and Bioethics (A6005C17)	15
Introduction to Animal Welfare, Behaviour and Ethics (A4009C17)	15	**Options**			Advances in Equine Science (A6002C17)	15
		Introduction to Small Business Management (F5005C17)	15			
		Philosophy of Zoos (A5007C17)	15			
		Animal Ethics (A5014C17)	15			

Professional Scholarship Programme (PSP) 1 - Academic Skills Development

Year of study 1
Code A4001C17
Credits 15
Core/option Core
Module contact Mrs Emily Chapman-Waterhouse

This module supports the development of students' personal, academic, employability and self-management skills for students in the first year of their undergraduate studies. Whilst the module provides a basis for the rest of the Professional Scholarship Programme it also supports learning in every other module. The module will be delivered throughout the academic year to students on animal-health related undergraduate courses. The main rationale for a first year module of this type is to ensure all students are fully equipped for higher education and to provide space in the curriculum in which to develop relevant skills to aid progression within and out with technically oriented modules. The key themes addressed by this module include transition into higher education and beyond the first year, approaches to learning, independent study, effective communication for animal health-related vocations, reading and reviewing literature, referencing convention, using feedback for learning and using technology to enhance learning. Whilst the roots of the module are in academic skill development, learning resources and assessments will be tailored to the vocational areas relevant to students. Students will need to actively undertake a self- review of progress at regular intervals and develop action plans for self-development.

Fundamentals of Physiology

Year of study 1
Code A4007C17
Credits 15
Core/option Core
Module contact Jim Huntington

This module introduces important anatomical terms and describes the concepts required to understand the processes involved in the functioning of organ systems and the maintenance of homeostasis in vertebrate species, including humans, food producing animals, companion animals and other species addressed within the programmes this module has been validated for. A broad knowledge of normal body structure and functioning provided by this module will be invaluable for students studying modules within the animal related programmes such as *Companion Animal Studies, Principles of Animal Health*, and *Animal Disease Sciences*. For those studying food related programmes the module will be invaluable for the study of Well-being Through the Lifecycle and later modules such as *Advanced Aspects of Nutrition*. This module is designed to be a prerequisite (for some courses) to either *Veterinary Physiology* or *Applied Anatomy and Physiology*.

Applied Anatomy and Physiology

Year of study 1
Code A4006C17
Credits 15
Core/option Core
Module contact Jim Huntington

This module expands and builds on the important anatomical and physiological terms and concepts introduced in *Fundamentals of Physiology* that are required to understand the processes involved in the locomotion, growth, sensory perception and co-ordination of organ systems in maintain a healthy animal. A broad knowledge of normal body structure and functioning will be invaluable for students studying modules such as *Companion Animal Studies, Principles of Animal Health, Anatomy for Veterinary Physiotherapy, Musculoskeletal Dysfunction* and *Animal Disease Sciences*.

Companion Animal Management

Year of study 1
Code A4017
Credits 15
Core/option Core
Module contact Mrs Jennifer Sadler

The module will provide students with knowledge of management practices associated with companion, collection and experimental animals. Emphasis will be placed on environmental requirements, nutritional needs, and animal management.

Large Animal Management

Year of study 1
Code A4015C17
Credits 15
Core/option Core

It is important that students studying animal-based courses have an understanding of the systems involved with the keeping of large animals and appreciate the commercial context in which many of these animals are kept. This module will highlight the differences in the approach to the management of large animals in comparison to that for companion animals (covered in Companion Animal Management). The underpinning knowledge gained in this module will enable these students to evaluate behavioural adaptation and the welfare of large animals and understand how management can impact upon the health of the animal. The students will be introduced to the husbandry requirements associated with the most common agricultural

systems involving animals such as cattle (dairy and beef), sheep, pigs, poultry and horses. Students will gain sufficient knowledge of the requirements of the system, and the effects of the management of the animal on its health and welfare status.

Principles of Animal Health

Year of study 1
Code A4011C17
Credits 15
Core/option Core
Module contact Dr Malgorzata Behnke

The immune system of domestic animals faces challenges from micro-organisms and parasites on a daily basis. Furthermore, the general public are at risk from zoonotic micro-organisms and parasites from the animals they keep and come in to contact with.

This module aims to develop students' knowledge and understanding of the micro-organisms and parasites that are important in animal health and the processes by which animals defend themselves against invasions of foreign organisms. This provides a crucial first step in understanding how these diseases can be controlled and will facilitate future learning in other modules which focus in more detail on control measures. Zoonotic risks are highlighted to enable students to identify at-risk situations and populations.

Laboratory Techniques

Year of study 1
Code A4004C17
Credits 15
Core/option Core
Module contact Dr Jayne Powles

Assessment of an animal's health status and the diagnosis of disease are often achieved by laboratory analysis of samples from the animal, feed and environment. This module will provide an understanding of laboratory safety and the general principles associated with sample collection, storage, processing and accurate and precise analysis. In addition, the student will gain confidence in the use of laboratory equipment and the interpretation of analytical results. The knowledge and experience gained will be essential for Animal Production Science and Animal Health Science modules where specific analytical techniques will be applied.

Introduction to Animal Welfare, Behaviour and Ethics

Year of study 1
Code A4009C17
Credits 15
Core/option Core

This module will introduce students to the science of animal behaviour and the importance of behaviour in our understanding of animal welfare. It will also consider the ethics of society's usage of different types of animals and the role of legislation and different organisations in the promotion of the interests of animals. Examples will be drawn from a range of diverse species and scenarios to illustrate the principles and practices discussed.

The content of this module will be of benefit to anyone considering working either directly or indirectly with animals in a range of environments. An appreciation of the science of animal behaviour and welfare and how underlying ethical values may influence the acceptability of animal use, will enhance the ability of the individual to undertake welfare assessments of the animals they are responsible for. The knowledge and understanding gained in the module will be an important foundation for those going on to study the module Principles of Animal Welfare and Behaviour.

Animal Disease Science

Year of study 2
Code A5009C17
Credits 15
Core/option Core

This module aims to develop the student's knowledge of disease causing agents, teach them how disease affects the body, how the body responds, and how testing can be used to diagnose disease and disease-causing agents.

The module builds on the knowledge gained in Principles of Animal Health, and assumes a good working knowledge of normal anatomy and physiology.

Companion Animal Studies

Year of study 2
Code A5012C17
Credits 15
Core/option Core
Module contact Mrs Susan Jeavons

An understanding of the principles of companion animal nutrition, health, and reproduction is essential for the successful management of companion animals.

This module is designed to introduce students to the principles of companion animal nutrition and the effects of differences in digestive anatomy. As well as the physiological processes on nutrients supply, nutrient requirements and diet composition.

Reproductive processes of a variety of companion animals will also be considered, with an understanding of how genetic information can be passed to the next generation in breeding programmes.

Companion animal health will be explored for a variety of companion animal species. The effect of health on welfare and behaviour will also be considered.

Farm Animal Health

Year of study 2
Code A5005C17
Credits 15
Core/option Core

The public are now more aware of farming practices and animal welfare issues and with growing concerns about antimicrobial resistance it is paramount that those involved with farmed livestock have a very good knowledge of both the maintenance of good health, through disease management, and of high standards of welfare which are fundamental to the success of efficient and acceptable animal production practices. This module will aim to provide students with an understanding of the importance of disease prevention, rather than treatment, and the ability to develop integrated disease control programmes to maximise livestock health and welfare.

Farm Animal Nutrition

Year of study 2
Code A5002C17
Credits 15
Core/option Core
Module contact Dr Robert Wilkinson

An understanding of factors affecting dietary nutrient supply and animal nutrient requirements is essential for ration formulation and the design of feeding strategies to optimise the efficiency of feed utilisation,

product quality and animal welfare, whilst mitigating any detrimental effects on the environment. This module will examine the chemical components of animal feeds and develop an understanding of how the chemical composition of feeds contributes to nutrient supply in farm animals. It will also cover the main techniques associated with feed evaluation and develop the ability to calculate animal requirements and utilise quantitative data in the formulation of rations and feeding strategies for different classes of farm animals. It will also cover mineral/vitamin nutrition and the metabolic consequences of nutrient deficiency or excess.

- Analyse animal feeds to determine their chemical composition and nutritional value.
- Explain factors affecting nutrient supply from feeds and the nutrient requirements of farm animals.
- Evaluate diets to assess the adequacy of nutrient supply, predict performance.
- Formulate diets and feeding strategies to satisfy the nutrient requirements of different classes of farm animals.
- Relate the metabolic function of essential minerals/vitamins to symptoms of deficiency or toxicity.

Equine Science

Year of study 2
Code A5013C17
Credits 15
Core/option Core
Module contact Dr Malgorzata Behnke

It is estimated that there are around 1 million horses in the UK and the equine industry is the second largest contributor to the rural economy behind agriculture. Consequently, the ability to successfully manage and maintain the well-being of horses is very important. The well-being of horses depends on the provision of an appropriate environment, adequate nutrition and the management of health status.

This module aims to develop an understanding of the principles of equine science, in particular environmental management, nutrition, health and reproduction. Common and important health problems associated with horses are covered and the roles of management and husbandry in their prevention and control are explored.

Research Methods (Animals)

Year of study 2
Code A5011C17
Credits 15
Core/option Core
Module contact Dr Stephen Mansbridge

The ability to collect, analyse and interpret data appropriately is a core skill for all those involved in modern animal science. In view of this, research skills are important to enable the critical appraisal of published research, and for the development of appropriate study designs to fulfil research objectives. This module forms part of the Professional Scholarship Programme (PSP) and is taken by all BSc and MSci students studying animal programs. The skills gained within this module are essential for the completion of the level 6 / 7 research projects in the final year. Students will learn valuable skills covering critical literature reviews, the importance of research designs and protocols in the context of quality assurance schemes, data collection / analysis and presentation of information. By carrying out statistical analysis using appropriate software during tutorials, the students will develop their ICT skills and further their understanding of the role of statistics in the research process.

Principles of Animal Behaviour and Welfare

Year of study 2
Code A5008C17
Credits 15
Core/option Core

Their complex behaviour is one of the main factors that distinguish the Animalia from the other Kingdoms of Life. This module aims to explore the richness and diversity of the behaviour we see in the animal kingdom, considering the various factors that have influenced its evolution. Although there will be an emphasis on the more complex behaviour patterns seen in the higher animals, this module will consider the behaviour of animals in general, and will not focus on just the domesticated species. This diverse approach will help in the understanding of the general principles which underpin the development of the various patterns of behaviour we observe in animals.

Animal welfare is of major concern to those working in the animal industry as well as the general public. In this module, students are encouraged to consider the issues that affect the welfare of many groups of animals such as farm, companion, zoo and research animals. The physiological and behavioural changes which occur when welfare is compromised will be studied and how these may be used to assess an animal's welfare status. The philosophical and ethical considerations of how we use animals will be discussed and an overview is given of the legislation which governs animal welfare across a range of species.

Introduction to Small Business Management

Year of study 2
Code F5005C17
Credits 15
Core/option Option
Module contact Mary Munley

This module provides a general introduction to business creation and management for students training to be animal health practitioners and other related disciplines in the veterinary sector. This module introduces students to the business planning approaches necessary to establish and manage a small business.

The module will present basic managerial concepts and techniques in marketing and finance that students need to understand to operate a small business. It enables them to acquire and demonstrate attitudes and skills necessary for communication, numeracy, problem solving and teamwork skills. It is designed to be a stand-alone module although students may have the opportunity to develop their interests further in subsequent modules.

Philosophy of Zoos

Year of study 2
Code A5007C17
Credits 15
Core/option Option
Module contact Dr Ellen Williams

Zoos and menageries began as prestigious private collections. In the 19th Century many zoos were established as sites of recreation. The primary role of entertainment continued to the 1960s but as societies views have changed, zoos have had to revise their "missions". Development of zoo licensing legislation and key organisations such as British and Irish Association of Zoos and Aquariums (BIAZA), European Association of Zoos and Aquaria (EAZA), World Association of Zoos and Aquariums (WAZA) has supported zoo development. Zoos have advanced from predominantly recreational facilities to centres of research excellence. Modern zoo missions are centred around four key principles: education, research, conservation and recreation. Students will appreciate the extensive development of zoos over time, including advances in understanding of animal health and welfare needs, and review how modern zoo missions are undertaken by zoological collections.

Animal Ethics

Year of study 2
Code A5014C17
Credits 15
Core/option Option
Module contact Stephen Baugh

Most of us interact with animals on a daily basis, whether that be via our pets, via commercial animals in a work environment or through the animal products that most of us eat. Through these interactions animals are treated by humans in particular ways dependent on many factors including species, utility, religious or cultural beliefs and beliefs based on an animal's sentience or intrinsic value. This module considers our interactions with animals and explores the challenges we face when making moral judgements about how we utilise and treat animals. We will consider many questions that underpin our beliefs about other species and our interactions with them. How should we treat animals? Is it acceptable to use animals for our own benefit? Do animals have intrinsic value? Do animals have rights?

The main ethical theories that are useful when exploring these issues are discussed and explained and examples of how these theories can be applied to our interactions with animals are discussed.

Placement year

Year of study 3
Core/option Core

Read our dedicated Placement Learning pages for information on the many benefits of the placement year.

Honours Research Project

Year of study 4
Code HRPROJC17
Credits 30
Core/option Core

The Honours Research Project is designed to allow students to develop the skills and personal resilience needed to undertake a sustained, significant and high quality project. In conjunction with his or her supervisor, and in light of detailed course specific advice, each student will select a topic for investigation. They will then plan, execute and report their project. The module will draw upon learning from other taught modules, but it also requires a high degree of independent learning.

Students will need to apply their learning about the research methods associated with their discipline as they locate data to support their project; they may need to apply methods creatively according to the nature of their research topic. Throughout the module, students will be expected to make choices about the scale and manageability of their work; they will also need to apply good time management skills to ensure success. The project will require all students to search for literature related to their topic and to read independently. Students must make decisions about the direction of their research, and they will be expected to work pro-actively to benefit from supervision opportunities.

Students will be expected to ensure that each part of their project is ethically sound; this means following protocols but also by developing an ethical mind-set which is sensitive to stakeholders and issues arising in the research process. Students must ensure that they attend to issues of health and safety throughout their research.

Integrated Health Management

Year of study 4
Code A6018C17
Credits 30
Core/option Core
Module contact Dr Claire Kershaw

Often factors affecting animal health, disease, welfare and production such as nutrition, reproduction and epidemiology are taught independently. Within this module, students will learn the importance of considering how these individual factors influence one another. This module integrates these factors to develop student's ability to assess the management status of various animal management systems.

The application of knowledge and intellectual skills gained from the module and from experience within the animal industry will be required to formulate appropriate programmes for the maintenance of the health and welfare of the animals and also of the health and safety of staff members and the public.

Applied Companion Animal Health, Welfare and Behaviour

Year of study 4
Code A6007C17
Credits 15
Core/option Core
Module contact Stephen Baugh

An integrated understanding of companion animal health, welfare and behaviour is essential for the development of companion animal management programmes that ensure optimum welfare.

This module is designed to provide a detailed knowledge of the factors involved in the aetiology and development of common diseases seen in companion animals (cats, dogs, small mammals, birds and reptiles) and develops the skills required to recognise signs of ill health in animals and to develop disease control and prevention strategies.

The behaviour of companion animal species will be considered, how health can influence behaviour, why certain behaviours may be suppressed in domestic settings and how this may lead to the development of pathology and inappropriate or abnormal behaviours. The prevention and control of behavioural problems will also be considered.

Aspects of animal physiology, nutrition, health and general husbandry introduced in earlier modules will form an essential background for this module.

Advances in Farm Animal Health, Welfare and Behaviour

Year of study 4
Code A6003C17
Credits 15
Core/option Core

This module will deepen students' understanding of farm animal welfare and its links to animal health, behaviour and disease control. With the increasing public interest in the welfare of farm animals, an understanding of different indicators and how these may show an animal's welfare status is required by those involved in any aspect of animal production. The welfare of animals is important not only during their housing and management but in response to handling, transport and slaughter; this module will focus on the welfare of farm animals in all of these situations. There is also growing public concern for human food safety and the importance of animal health; graduates in all fields of animal science need to understand efficient diagnostic techniques and disease surveillance and possibilities for the future in this field. Understanding the production of effective animal medicines is also necessary.

Advances in Animal Production Science

Year of study 4
Code A6001C17
Credits 15
Core/option Option
Module contact Dr Claire Kershaw

This module is designed to develop the ability of students to analyse animal systems and developments in technology, including the application of precision techniques. The application of these technologies to sustainable, environmentally and animal welfare conscious production systems will be evaluated.

This module will build on knowledge gained in previous farm animal modules including Farm Animal Production Science, Farm Animal Science and Sustainable Livestock Production Systems.

The learning associated with the module will be achieved primarily through keynote lectures both from university staff and visiting speakers.

Animal Improvement and Bioethics

Year of study 4
Code A6005C17
Credits 15
Core/option Option

With the rapid developments in animal breeding technologies an understanding of the processes involved and their application to modern livestock production is required. This module will provide the student with the opportunity to apply the genetic principles underlying animal breeding to a number of species of animals and systems of livestock production. To undertake this, students will require an understanding of the systems used in livestock production and other roles to which animals are currently put and may be used for in the future in the context of the socio-economic environment in which they operate. In addition, the relationship between animals and humans is explored and consideration is given to the ethical implications of the various roles of animals in society and the manipulation of animals by biotechnology.

Advances in Equine Science

Year of study 4
Code A6002C17
Credits 15
Core/option Option

Knowledge of the scientific principles that underlie recent advances in areas relating to equine health, nutrition and reproduction is increasingly important in an industry that has advanced considerably over the last decade. This module will build on the concepts learned in Equine Science and allow the student to develop a deeper understanding of issues affecting the equine industry in these three areas. Considerable independent study will permit students to develop the ability to discriminate, evaluate and analyse information from a variety of sources.

- Evaluate current issues affecting equine health, nutrition and reproduction.
- Critically comment on future and potential developments within equine reproduction.
- Apply advances in animal disease and nutritional science to the management of equine animals.